

Social exclusion and short video addiction in Chinese college students: The mediating role of
boredom and self-control

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Abstract

Background Short video apps are very popular among Chinese college students, and some students even rely on them. Most of the current research only focuses on Internet addiction, and seldom pays attention to the phenomenon of short video addiction. Its influencing factors and formation mechanism are worth exploring.

Objectives This study aims to explore the relationship between social exclusion and short video addiction among college students, and the mediating roles of boredom and self-control.

Methods This study adopted a Multi-stage investigation and investigated 532 college students (39% males; mean age 19.32 ± 1.23 years) with social exclusion scale, boredom proneness scale, self-control scale, and short video addiction scale. The mediating effect was tested with Process 3.1.

Results The results showed that social exclusion could directly affect short video addiction. Moreover, boredom and self-control can independently mediate the association between social exclusion and short video addiction. Furthermore, boredom and self-control can sequentially mediate the association between social exclusion and short video addiction.

Conclusion Theoretically, this study modified the I-PACE model, indicating that behavioral addiction, such as short video addiction, should consider personal and distant social factors. Practically, the results suggested that schools should reduce peer rejection and improve students' mental health literacy to reduce boredom and enhance self-control, thus effectively preventing short video addiction.

Keywords Social exclusion, Boredom, Self-control, Short video addiction

Introduction

With the rapid development of mobile internet technology, short video applications have entered the vision of the Chinese public, such as Tik Tok and Kwai, which have been widely accepted and used by people, especially college students. According to an authoritative survey, the number of short video users in China has reached 1026 million, accounting for 95.2% of the total Internet users [1]. While short video applications make life more colorful, they have become a "sweet poison". Once used, some users are difficult to stop and even develop symptoms of addiction. Therefore, following internet gaming disorder, short video addiction has become a new phenomenon concerned by researchers. Short video addiction is an obsessive state in which individuals repeatedly, frequently, and uncontrollably use short videos. Once users become addicted, it will bring adverse effects on their physical and mental health, such as anxiety, depression, stress, self-harm, as well as anorexia [2, 3, 4]. For this reason, short video addiction has attracted the attention of parents, schools, and society and has become an important topic in many disciplines, including psychology, pedagogy, and sociology. Therefore, exploring the risk factors of short video addiction to prevent it scientifically and protect users' physical and mental health is necessary.

Social exclusion and short video addiction

Although some influencing factors of short video addiction have been discussed, social exclusion is rarely involved. Social exclusion refers to the interactive phenomenon of being rejected and ignored by individuals or groups in social communication, which is a stressful event in interpersonal communication [5]. According to the general strain model, problem behaviors like short video addiction are closely related to external stress or stressors [6]. There are three kinds of external

pressure: The frustration of individual psychological needs, the reduction of positive experiences, and exposure to negative experiences. Social exclusion belongs to harmful experience exposure so it may lead to short video addiction. Individuals who are rejected by others can lead to psychological pain, prompting the individual to develop an escape motivation. Short videos become good placebos, and individuals can choose content that makes them feel happy according to their preferences to fight the pain caused by social exclusion [7]. More importantly, the application platform can automatically and continuously push the content individuals are interested in according to their preferences to get positive rewards continually [8]. This sense of psychological compensation and pleasure makes it easy for individuals to become addicted. As a new phenomenon and problem, few studies have directly discussed the relationship between social exclusion and short video addiction. Still, similar studies have found that social exclusion is significantly related to other forms of technical addiction, such as mobile phone dependence and Internet addiction [5]. In summary, this study proposes hypothesis 1: social exclusion can significantly predict short video addiction.

Boredom as a mediator

According to the general strain model, the influence of external stressors on short video addiction is often mediated by negative emotions [6]. Previous studies have paid more attention to anxiety and depression, but little attention has been paid to the impact of boredom on individual psychological and behavioral problems. Therefore, this study attempted to examine the mediating role of boredom in the relationship between social exclusion and short video addiction.

Boredom is “a negative experience of desiring but being unable to engage with the environment or in satisfying activities” [9]. On the one hand, social exclusion is related to boredom. In other words, social exclusion may be one of the causes of boredom. According to psychological needs

theory, establishing social relationships is essential to psychological needs [10, 11]. Social exclusion can lead to lacking basic psychological needs such as individual belonging and esteem needs. This unsatisfied state of psychological needs makes individuals feel dissatisfied with life and lacks a sense of meaning in life, thus arousing boredom [12].

On the other hand, boredom is related to short video addiction. According to the sensation-seeking theory, it is difficult for individuals to survive in a "vacuum" of sensation, and certain stimuli are needed to maintain the sensory balance of the body [13]. Boredom is a state of low arousal that will drive individuals to seek meaningful or extreme stimulation actively. Short videos can automatically screen and push content according to personal preferences, which can highly fit an individual's personalized needs and bring individuals a sense of pleasure and excitement, so it is easy to make them addicted. In addition, similar studies have found a significant relationship between boredom and Facebook addiction [11]. Therefore, this study proposes hypothesis 2: Boredom would mediate the relationship between social exclusion and short video addiction.

Self-control as a mediator

Self-control refers to the ability to consciously control the direction of one's behavior by overcoming impulses and habitual or automatic responses [14]. Based on the literature review, self-control may mediate the relationship between social exclusion and short video addiction. Firstly, social exclusion is related to self-control. According to the temporal need-threat model, the social exclusion will threaten various psychological needs of individuals, including the sense of control [15, 16]. In addition, social exclusion will consume individuals' cognitive resources, reduce their sense of self-efficacy, and lead to impaired self-control ability [17]. Empirical research also found a significant negative correlation between social exclusion and self-control [15, 18].

Secondly, self-control is related to short video addiction. According to the I-PACE model of addictive behavior, weak self-control ability is a risk factor for addictive behavior [19]. Faced with short videos' beautiful content and functions, individuals with better self-control can rationally control and adjust their internal needs. It makes their user behavior more aligned with social expectations and norms, and they will not be addicted to short videos [20]. On the contrary, individuals with poor self-control can hardly resist the great content presented in short videos. They will lose the sense of time in the process of using, which makes them more prone to short video addiction. Previous studies have found a significant negative correlation between self-control and mobile phone or social media addiction [21, 22, 23]. Therefore, this study proposes hypothesis 3: self-control would mediate the relationship between social exclusion and short video addiction.

A Sequential mediation model

Boredom may be an essential factor affecting self-control. According to the I-PACE model of addictive behavior, both negative emotions and psychological stress will consume self-regulation resources and impact individual self-regulation systems [19]. As a negative emotional experience, boredom may lead to higher levels of ego depletion, reducing self-control over future behavior [24]. In addition, Boredom could also aggravate an individual's sensation-seeking, which leads to impaired self-control [25]. An empirical study found that individuals with higher levels of boredom have poorer self-control and become more impulsive [22]. A longitudinal study also found that depressive symptoms predicted deficits in executive functioning rather than the other way around [26]. In summary, social exclusion may increase boredom, reduce self-control, and eventually lead to short video addiction. Therefore, this study proposes hypothesis 4: boredom and self-control would sequentially mediate the relationship between social exclusion and short video addiction.

In summary, our proposed serial mediation model of the link between social exclusion and short video addiction is exhibited in Fig. 1.

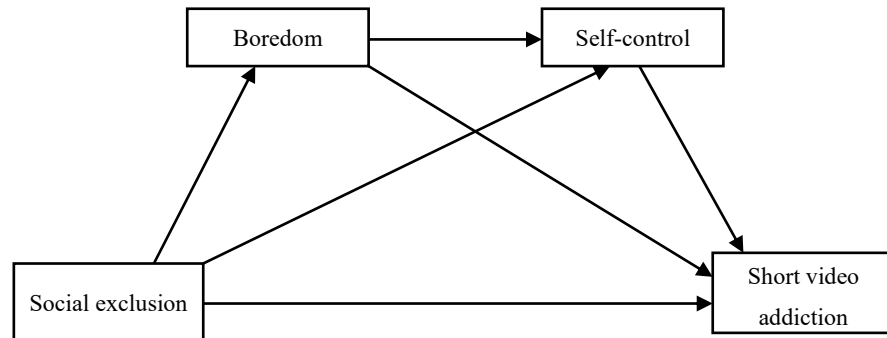


Fig. 1. The proposed serial mediation model.

Methods

Participants and procedures

This study adopted convenient sampling to select two universities in Shandong Province and conducted online tests between public classes after obtaining the consent of the schools and teachers. This study adopted a multi-stage survey technique to reduce the pressure on the participants to answer the questions. Only the social exclusion and boredom scales were distributed at T1, and the self-control and short video addiction scales were distributed one month later (T2). Finally, a total of 609 questionnaires were collected, and 523 valid questionnaires remained after excluding invalid questionnaires such as short filling time and uniform answering options for the same scale (317 females and 206 males; 161 freshmen, 173 sophomores, 126 juniors, and 63 seniors; $M_{age} = 19.32$, $SD_{age} = 1.23$). The institutional review board of the first author's university granted permission to implement this investigation.

Measures

Social Exclusion

The Social Exclusion Scale was used to measure social exclusion [27]. It has 11 items, including

two dimensions of rejection and neglect. Items were rated on a 5-point Likert scale from “strongly disagree” to “strongly agree”. Previous studies have shown that it can be applied to Chinese college students [28]. Its Cronbach's α coefficient in this study was 0.83.

Boredom

The Short Boredom Proneness Scale was applied to measure boredom [29]. The scale is single-dimensional and includes eight items, which was scored on a 5-point Likert scale from “totally disagree” to “totally agree”. Previous studies have shown that it can be applied to Chinese college students [30]. Its Cronbach's α coefficient in this study was 0.88.

Self-control

The Chinese Version of the Brief Self-Control Scale was used to measure self-control [31]. It has seven items, including two dimensions of self-discipline and impulse control. Items were rated on a 5-point Likert scale from “strongly disagree” to “strongly agree”. Its Cronbach's α coefficient in this study was 0.78.

Short video addiction

The Chinese version of the Bergen Social Media Addiction Scale [32] was adopted, and the description of “social media” in each item was changed to “short videos”. The single-dimensional scale includes six items, scored on a 5-point Likert scale from “totally disagree” to “totally agree”. Its Cronbach's α coefficient in this study was 0.91.

Data analysis

SPSS 22.0 and Process 3.2, developed by Hayes [33] were used for data analysis. A bootstrapping technique was used to examine the significance of the direct and indirect effects by generating 1000 bootstrap samples. Before data processing, single-factor confirmatory factor analysis was used to

test the common method biases. The results showed poor model fit ($\chi^2/df = 9.87$, RMSEA = 0.11, CFI = 0.56, NFI = 0.43, TLI = 0.42), indicating no apparent common method biases in this study.

Results

Preliminary analyses

Means, standard deviations, and correlations are demonstrated in Table 1. Social exclusion was significantly positively correlated with boredom and short video addiction and significantly negatively correlated with self-control. Boredom was significantly negatively associated with self-control and positively correlated with short video addiction. Self-control was significantly negatively correlated with short video addiction.

Table 1. Descriptive statistics and correlations for the observed variables (N = 523)

Variables	M	SD	1	2	3
1.T1 social exclusion	2.32	0.81			
2.T1 boredom	2.38	0.67	0.247**		
3.T2 self-control	2.86	0.82	-0.163**	-0.225**	
4.T2 short video addiction	2.47	0.87	0.263**	0.269**	-0.365**

Testing for the mediation model

The results of the mediating effect analysis showed that boredom played a significant mediating role between social exclusion and short video addiction. In addition, self-control played an important mediating role between social exclusion and short video addiction. The chain mediating effect of boredom and self-control between social exclusion and short video addiction was also significant. The specific path coefficients are shown in Fig.2 and table.2. This study examines the differences in mediating effects. The results indicated that, compared with ind2 and ind3, ind1 has

an enormous mediating impact, and there was no significant difference in the effect values between ind2 and ind3.

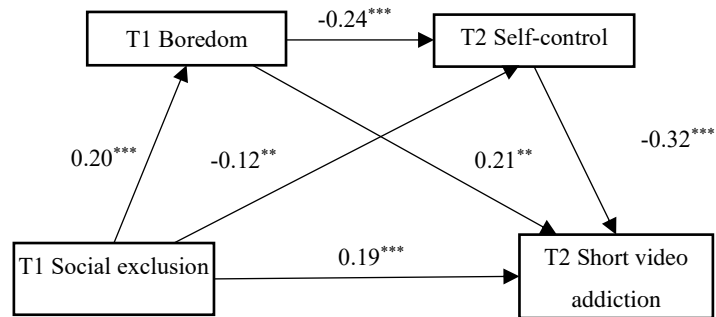


Fig.2. The mediation model (unstandardized estimated).

Table 2 The direct and indirect effects of the mediation model (unstandardized estimated)

Model pathways	Estimated	95% CI	
		Lower	Upper
Direct effect			
social exclusion → short video addiction	0.19	0.10	0.28
Indirect effects			
social exclusion → boredom → short video addiction (ind1)	0.04	0.02	0.07
social exclusion → self-control → short video addiction (ind2)	0.04	0.01	0.07
social exclusion →boredom→ self-control→ short video addiction (ind3)	0.02	0.01	0.03
Mediating effect difference test			
Test1(ind1-ind2)		-0.04	0.05
Tes2(ind1-ind3)		0.00	0.53
Test3(ind2-ind3)		-0.02	0.06

Discussion

Unlike previous studies on mobile phone addiction and internet addiction, this study accurately focuses on short videos application. It discusses for the first time based on the common problem of short video addiction in China. From the perspective of interpersonal relationships, this study analyzed for the first time the inducing effect of social exclusion on short video addiction and the mediating effect of boredom and self-control in the relationship between them. This study not only enriches the relevant research on short video addiction in China but also helps to form a comparison with similar studies in other countries to have a more comprehensive understanding of the formation mechanism and cross-cultural differences of short video addiction.

The association between social exclusion and short video addiction

The results show a significant correlation between social exclusion and short video addiction, and the former can significantly predict the latter. This result verifies Hypothesis 1, consistent with the compensatory Internet use theory and the general stress model [6, 7]. At the same time, this study is also a supplement and modification to the recently popular I-PACE model, which only pays attention to the individual factors and interaction of short video addiction and other unique forms of technology addiction without considering environmental factors [19].

Social exclusion can induce short video addiction because short videos may compensate for psychological needs. Social exclusion belongs to a kind of social trauma, and the excluded individuals will have psychological pain and burnout due to belonging frustration. Such real-life stressful events encourage individuals to seek good channels for venting and soothing [28]. Short video applications have precise content push algorithms and functions, which can well meet the psychological needs of individuals and improve their psychological pleasure [34]. Most importantly,

the content in short videos is often both ostentatious, exaggerated, and decorated, and powerfully uses stickiness when soothing individual psychological pain. Once interested, you can continue to follow the dynamic content the uploader updates. Eventually, it becomes more and more challenging to jump out of the virtual world, leading to short video addiction [2, 35]. This result goes further than previous studies on mobile phone dependence, indicating that social exclusion does not necessarily lead to addiction to the mobile phone itself but to some functions. Short videos are an essential part of it.

The mediating role of boredom

The results also show that social exclusion has a direct effect on short video addiction and indirectly leads to the emergence of short video addiction by inducing boredom. This result verifies hypothesis 2, which is also in line with the general stress model, and shows that stressful events can lead to the emergence of problem behaviors such as short video addiction through the radiation of negative emotions [6]. When discussing negative emotions, previous studies often pay more attention to anxiety and depression and seldom pay attention to boredom. Boredom is even more common among college students and even working people than the above two kinds of negative emotions, and sometimes it is even called "hollow disease" [9]. This study validates its crucial role in social exclusion and short video addiction.

Firstly, social exclusion is an essential factor in promoting boredom. It is difficult for ostracized individuals to integrate into the group, which will lead to the lack of satisfying their basic psychological needs and a low core self-evaluation, thus resulting in a lack of sense of life meaning and more boredom [36]. In addition, reducing social opportunities and social activities caused by social exclusion also reduces the individual's meaningful experience. It makes the individual's life

more monotonous and boring, thus accumulating more feelings of boredom [30]. Secondly, accumulating dull feelings can easily lead to overuse or even addiction to short videos. Individuals under the control of boredom are often in a state of low arousal, so individuals tend to look for stimuli to restore the sensory balance of the body [30]. The short video is a typical mobile phone application and is updated quickly. The most important thing is that its content has both words, audio, and images, which can stimulate users' multiple senses in an all-around way. It is easy to make users love it and increase stickiness. In addition, many application platforms encourage users to consume content while producing content to earn income. It is equivalent to a kind of reinforcement so that individuals can reduce their boredom and increase their dependence, eventually leading to short video addiction.

The mediating role of self-control

This study also found that self-control can significantly mediate between social exclusion and short video addiction, which verified hypothesis 3. For the first path of this indirect effect, social exclusion can substantially weaken the self-control ability, consistent with the previous research results [37] and in line with the view of the temporal need-threat model [16].

Social exclusion makes it difficult for individuals to satisfy their needs of belonging and love and damages their feelings of self-worth [15]. When individuals have poor self-evaluation, they will reduce self-constraints and requirements. In addition, such people will also experience a sense of powerlessness and helplessness in coping with the event, resulting in a decline in their level of self-control [17]. Moreover, social exclusion can also lead to rumination, thus occupying cognitive resources and reducing the ability for individual self-control [37]. For the second path of this indirect effect, self-control can significantly negatively predict short video addiction, which is consistent

with the results of previous similar studies [22, 23]. The reason is that individuals with poor self-control are less resistant to new things. Under the temptation of fashionable and diverse short video content, individuals will find it hard to resist and become addicted to it [23]. In addition, it is difficult for this kind of person to perceive and manage time, so there will be time perception deviation in the process of using short videos, and it is difficult to quit and withdraw [22]. In other words, social rejection can cause individuals to become addicted to short videos by impairing their self-control.

The sequential mediation

This study also found that boredom and self-control mediated the association between social exclusion and short video addiction, which supported hypothesis 4 and was consistent with the viewpoint of the I-PACE model [19]. The I-PACE model emphasized the interaction between affect and execution, and this study also found that boredom induced by social exclusion can indeed affect the strength of self-control. One explanation could be that negative emotions may deplete individuals' cognitive resources, leading to executive control dysfunction and thus weakening their level of self-control [24]. This result was also consistent with the results of previous studies [22]. Overall, this study is a modification of the I-PACE model. In addition to individual factors and their interactions that can lead to addictive behaviors, there are also distant environmental factors that may affect individual factors. In summary, this study showed that ostracized individuals were more likely to experience boredom, which weakened their self-control and ultimately led to short video addiction.

Limitations and implications

There are several limitations of the current research. First, although this study adopted a multi-stage method to collect data, it failed to control the autoregressive effect of the variables themselves. In

the future, longitudinal design should be carried out to reveal the causal relationship between these variables. Second, this study only considered the mediating mechanism of social exclusion affecting short video addiction and did not consider the moderating mechanism, which can be considered in the future. Finally, this study only tested the hypothetical model in Chinese participants, and cross-cultural research can be carried out based on the popularity of short videos in the future.

Despite these limitations, this study also has important implications. Theoretically, few studies have explored the formation mechanism of short video addiction by combining social and individual factors. This study modified the I-PACE model to a certain extent, indicating that behavioral addiction, such as short video addiction, should consider personal and distant social factors. Practically, it is difficult to eliminate the use of mobile phones, and university administrators should consider preventing addiction to the specific application of mobile phones. For example, to avoid short video addiction, schools should create a campus atmosphere of mutual help and reduce peer exclusion and rejection. Schools should strive to minimize peer exclusion and rejection and create a campus atmosphere where students help each other. Schools can also carry out positive mental health education, improve students' mental health literacy, reduce boredom, and enhance self-control to prevent short video addiction effectively.

Conclusion

The following conclusions were drawn from this study: (1) Social exclusion can directly affect short video addiction. (2) Both boredom and self-control can independently mediate the relationship between social exclusion and short video addiction. (3) Boredom and self-control can sequentially mediate the relationship between social exclusion and short video addiction.

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Authors' contributions

Yali Zhang and Xiaoli Li conceived and designed this study, analyzed the data, and completed the first draft; Ruohan Bu edited the writing. All authors contribute sufficiently to this work. All authors read and approved the final manuscript.

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Availability of data and materials

The datasets are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the 1964 Helsinki declaration and its later amendments. Approval to conduct the study was obtained from the Ethics Institutional Review Board of Hebei Normal University. The participants provided their written informed consent to participate in this study.

Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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